

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 89-183

SITE CLEANUP REQUIREMENTS FOR:

INTEL CORPORATION, FAB FACILITY 1
3601 JULIETTE LANE
CITY OF SANTA CLARA
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. Location and Facility Description - Intel Corporation, hereinafter called the discharger, owns and operates a semiconductor manufacturing plant on an approximately 20 acre site in the City of Santa Clara, Santa Clara County. This facility (Fab 1) is located at 3601 Juliette Lane, near the intersection of the Montague Expressway and Bayshore Freeway (see site location map) in an industrial area with several neighboring semiconductor manufactories.
2. Site History - This facility has been in operation as a semiconductor manufacturing plant since 1979. As part of the manufacturing process the discharger has operated solvent storage, distribution, and recovery systems. In addition, the plant operation includes a waste water treatment system involving the use of acids and bases. In 1985 a mechanical failure in piping for a diesel fuel system for a backup generator resulted in approximately 1200 gallons of diesel fuel being released to the subsurface. Also, in 1985 a waste solvent tank and associated soils were removed and replaced with a new, doubly contained, underground tank system. Following these actions Board staff, in a December 20, 1985 letter considered the diesel tank investigation and cleanup successfully completed. Site investigation, including a soil investigation was also completed and submitted to Board staff in 1985.

The facility is still in operation as a semiconductor manufacturing plant utilizing processes similar to those that have been used historically. Expansion of the operations at this site has included the construction of new buildings.

3. Hydrogeology - The site is contained within the San Jose sub-basin of the Santa Clara Valley groundwater basin. This is an area of alluvial deposition which has resulted in deposition of interbedded sands, silts and clays, with widely varying porosities, permeabilities, and transmissivities. The regional hydraulic gradient is generally to the north, with

most production of water coming from deeper (i.e. greater than 300 ft) aquifers.

The local gradient measured by the 12 site monitor wells is to the north-northwest. The only local aquifer penetrated by the twelve site monitor wells is the shallowest or "A" aquifer at depths ranging from fourteen (14) to eighteen (18) feet below ground surface. The A aquifer, onsite, is approximately three feet in thickness. The approximate depth to groundwater in 1985, prior to groundwater extraction and the current drought condition, was 5 to 9 feet below ground surface. The current level of groundwater is approximately 14 feet below ground surface.

4. Chemicals Of Concern - Groundwater monitor wells were installed at this facility in 1984 and 1985 as part of the initial investigation. Twelve monitor wells and one extraction well were in place on the property in 1985 including a well that had been installed in 1981 to comply with Santa Clara County underground storage tank regulations. The chemicals present in the shallow groundwater have historically included components related to a 1985 diesel spill, and organic solvents.

The interim remedial actions have resulted in the reduction in groundwater monitor wells of the diesel fuel components to non-detectable levels, however trichloroethane (TCA), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethylene (1,1-DCE), and trichloroethylene (TCE) are still detected in the groundwater. TCA has historically been the volatile organic chemical most commonly detected in groundwater at this site.

5. Groundwater Pollution - Shallow (less than 30 feet) groundwater pollution is currently monitored, at the volition of the discharger, on a quarterly basis through a network of eleven monitor wells. One monitor well in an upgradient onsite location was destroyed in 1988 during the construction of a new building.

The existing monitor well network has adequately defined the lateral extent of the groundwater pollution plume in the "A" or uppermost aquifer and indicates that the groundwater pollution plume has not migrated beyond Intel's property. The current level of onsite groundwater pollution (March, 1989) is detected at the highest level in monitor well IF1-9 with 51 ppb of TCA, 19 ppb of 1,1-DCA, and 41 ppb 1,1-DCE. The highest overall level of groundwater pollution is detected at the influent to the groundwater treatment system, from groundwater extraction well R-2. The concentrations recorded at this sampling point in May 1989 included, TCA at 940 ppb, 1,1-DCA at 600 ppb, 1,1-DCE at 50 ppb, and total petroleum hydrocarbon (TPH) at 180 ppb. The extracted groundwater is

treated by carbon adsorption prior to discharge to a storm drain tributary of San Thomas Aquino Creek under NPDES Permit CA 0028649.

The onsite groundwater pollution by solvents is mostly TCA and related daughter products and has been detected in the shallow A aquifer. Vertical extent of groundwater pollution needs to be further defined. Groundwater pollution with TCE and related daughter products does exist in the A and B aquifers at an upgradient facility, although it is unknown whether this plume has migrated onto the Intel site. The potential migration of the upgradient groundwater pollution onto the Intel property is a concern and will be considered by Intel in evaluating the results of additional investigation, particularly the presence and type of pollutants in the next deeper or "B" aquifer.

6. Soil Pollution - Solvent odor, possibly indicative of soil pollution, was noted during the removal and replacement of an underground waste solvent storage tank in 1985. The presence of solvents in the excavation and soils may be related to possible leaks in a waste solvent tank. Samples of groundwater from the excavation contained TCA, 1,1-DCA, 1,2-DCA, and 1,1-DCE. However, soil samples from the excavation indicated only low levels of these pollutants in the soil. This soil was excavated and removed from the site for disposal. A groundwater monitor well (IF1-1) downgradient and near the solvent storage tank excavation has not detected levels of solvents above the detection limit. A source area for the solvent groundwater pollution has not been firmly established.
7. Interim Remedial Actions - Groundwater extraction and treatment has been ongoing since 1985 from extraction well R-2. A waste solvent tank and adjacent polluted soil was removed in 1985. The removal of the diesel fuel free product plume in shallow groundwater had been achieved by 1987, though low levels of dissolved petroleum hydrocarbon is still being recovered by the extraction system. The pumping rate from well R-2 was reduced in the spring of 1989, with Board staff concurrence, from 3 - 5 gallons per minute (GPM) to 1 - 2 GPM to minimize the risk of potential transport of groundwater pollutants onto the Intel site. The current groundwater extraction program is apparently successfully reducing the levels of shallow groundwater pollution by solvents. The installed interim remedial actions appear to be effective in limiting plume migration and reducing concentration of groundwater pollutants. No additional interim remedial actions are planned by the discharger at this time.

8. Regulatory History - Cleanup of the diesel plume was finalized by the Board in December 1985. An NPDES permit was issued to for the discharge of water from a water treatment plant in 1986 and amended in 1988 to include the discharge of treated groundwater. The discharger has filed quarterly monitoring reports as required under NPDES Permit CA0028649 and has also included quarterly groundwater monitoring data in these reports.
9. Scope of this Order - This Order provides tasks to complete site characterization and to determine and achieve final cleanup goals and objectives for groundwater.
10. The Board adopted a revised Water Quality Control Plan (Basin Plan) for the San Francisco Bay Region on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and groundwater.
11. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:
 - a. Municipal and Domestic Water Supply
 - b. Agricultural Water Supply
 - c. Industrial Service Water Supply
 - d. Industrial Process Water Supply
12. The discharger has caused or permitted, and threatens to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.
13. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
14. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity to submit their written views and recommendations.
15. The Board, in a public meeting on December 13, 1989, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Sections 13304 and 13267 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.
2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation any cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of soil or groundwater containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
2. The discharger shall conduct site investigation and monitoring activities as needed to define the current local hydrogeologic conditions and to define the lateral and vertical extent of groundwater pollution. Should monitoring results show evidence of pollutant migration, additional characterization and remediation of pollutant extent may be required.
3. Final cleanup goals for polluted groundwater , onsite and offsite, shall be in accordance with State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California". Proposed final cleanup levels shall be based on a feasibility study of remedial alternatives that compare cost, effectiveness, time to achieve cleanup goals, and an assessment of risk to determine effects on beneficial uses, human health and the environment. Cleanup levels shall also have the goal of reducing the mobility, toxicity, and volume of pollutants. Final cleanup levels shall be approved by the Board.
4. If groundwater extraction and treatment is considered as an alternative, the feasibility of water reuse, reinjection, and disposal to the sanitary sewer must be evaluated. Based on the Regional Board Resolution 88-160, the discharger shall optimize, with a goal of 100%, the reclamation or reuse of groundwater extracted as a result of cleanup activities. The discharger shall not be found

in violation of this Order if documented factors beyond the discharger's control prevent the discharger from attaining this goal, provided the discharger has made a good faith effort to attain this goal. If reuse or reinjection is part of a proposed alternative, an application for Waste Discharge Requirements may be required.

C. PROVISIONS

1. The discharger shall comply with the Prohibitions and Specifications above, in accordance with the following time schedule and tasks:

- a. TASK: CHARACTERIZATION OF VERTICAL EXTENT AND NATURE OF GROUNDWATER POLLUTION:

Submit a technical report acceptable to the Executive Officer documenting the proper installation of a well downgradient of extraction well R-2 in the next deeper water bearing zone (B) to establish the vertical extent of groundwater pollution. This report, depending upon the results of the analysis of groundwater from the deeper zone, should also include the proposed location of any additional wells necessary to complete the characterization of groundwater pollution in the "B" zone or a summary of data that indicates that the pollution does not originate onsite.

COMPLETION DATE: January 31, 1990

- b. TASK: PROPOSE FINAL GROUNDWATER AND SOIL CLEANUP OBJECTIVES:

Submit a technical report acceptable to the Executive Officer containing the results of the site investigation including the determination of the lateral and vertical extent of pollution; an evaluation of the existing interim remedial measures; proposed final groundwater cleanup objectives; a feasibility study evaluating alternative final remedial measures necessary to achieve final groundwater cleanup objectives; and the tasks and time schedule necessary to implement the recommended final remedial measures.

COMPLETION DATE: July 15, 1990

c. TASK: COMPLETE IMPLEMENTATION OF FINAL CLEANUP ACTIONS:

Submit a technical report acceptable to the Executive Officer documenting the implementation of the actions as proposed and accepted by the Executive Officer in accordance with Task b. above.

COMPLETION DATE: Sixty (60) days after the implementation of the remedial actions as proposed in the schedule included and accepted by the Executive Officer in Task b.

d. TASK: FIVE YEAR STATUS REPORT:

Submit a technical report acceptable to the Executive Officer containing the following:

1. The results of any additional investigative work completed,
2. an evaluation of the effectiveness of installed final cleanup measures,
3. additional measures to achieve final cleanup objectives and goals, if necessary,
4. a comparison of previously estimated costs with actual costs incurred and a revised projection of necessary to achieve final cleanup goals and objectives,
5. the tasks and time schedule necessary to implement any additional final cleanup measures,
6. recommended measures for reducing Board oversight activities,
7. describe the reuse of extracted groundwater, if any, and
8. evaluate and document the removal and/or cleanup of polluted soil, and groundwater.

If final groundwater cleanup objectives have not been achieved through implementation of the approved groundwater and soil remediation plans, this report shall also contain an evaluation addressing whether it is technically feasible to achieve these objectives by other means. If so, this report shall include a proposal for procedures to do so. If not, this report should contain proposed alternative groundwater cleanup objectives and rationale.

COMPLETION DATE: December 13, 1994

2. The submittal of technical reports evaluating final groundwater remedial measures will include a projection of the cost, effectiveness, benefits, and impact on public health,

welfare, and environment of each alternative measure. The remedial investigation and feasibility study shall consider the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 253 56.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resource Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California."

3. Technical reports summarizing the status of compliance with this Order, and monitoring data for all site monitoring wells, shall be submitted variously according to the schedule detailed below, commencing with the report for the fourth quarter 1989, due January 31, 1990. These reports may be combined with any reports required under NPDES Permit CA0028649. Sampling frequency shall be on an annual basis for wells IF1-1,4,5,7,8,10,11, and 13 and on a quarterly basis for wells IF1-3,2,9,12, and R-2. All new monitor wells shall be sampled quarterly for at least one year following installation and be sampled annually thereafter upon the approval of the Executive Officer.

Quarter	1st quarter	2nd Quarter	3rd Quarter	4th Quarter
Period	Jan-March	April-June	July-Sept	Oct-Dec
Due Date	April 30	July 31	October 31	January 31

The quarterly reports for the first and third quarters shall include;

- a. a summary of work completed since the previous quarterly report,
- b. appropriately scaled and labeled maps showing the location of all monitoring wells, extraction wells, and existing structures,
- c. updated water table and piezometric surface maps for all affected water bearing zones, and isoconcentration maps for key pollutants in all affected water bearing zones,
- d. a summary tabulation of all well construction data, groundwater levels and chemical analysis results for site monitor wells,
- e. a summary tabulation of volume of extracted groundwater, cumulative tabulation of pounds of pollutants removed by the groundwater extraction system, and results of chemical analysis for all site groundwater extraction wells,
- f. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned

- to prevent these obstacles from resulting in noncompliance with this Order, and
- g. in the event of noncompliance with this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance.
 - h. the report for the first quarter of each calendar year shall contain the data for the quarter and shall serve as a summary report for the previous calendar year and shall contain a summary tabulation of all the above data for the preceding year.

The quarterly reports for the second and fourth quarters shall include;

- a. a summary of work completed since the previous quarterly report,
 - b. appropriately scaled and labeled maps showing the location of all monitoring wells, extraction wells, and existing structures,
 - c. a summary tabulation of all groundwater level data and chemical analysis results for site monitor wells,
 - d. a summary tabulation of volume of extracted groundwater, cumulative tabulation of pounds of pollutants removed by the groundwater extraction system, and results of chemical analysis for all site groundwater extraction wells,
 - e. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned to prevent these obstacles from resulting in noncompliance with this Order, and
 - f. in the event of noncompliance with this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance.
- 4. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer.
 - 5. All hydrogeologic plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer.
 - 6. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control

records for Board review.

7. The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.
8. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order shall be provided to the following agencies:
 - a. Santa Clara Valley Water District
 - b. Santa Clara County Health Department
 - c. City of Santa Clara
 - d. State Department of Health Services/TSCD
9. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon the premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
10. The discharger shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.
11. If any hazardous substance is discharged in or on any waters of the State, or discharged and deposited where it is, or probably will be discharged in or on waters of the State, the discharger shall report such to this Regional Board, at (415) 464-1225 on weekdays office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within 5 working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects,

corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

12. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on December 13, 1989.

A handwritten signature in dark ink, appearing to read "Steven R. Ritchie", is positioned above the printed name.

STEVEN R. RITCHIE
EXECUTIVE OFFICER